CARDEROCK DIVISION, NAVAL SURFACE WARFARE CENTER

TECH transfer UPDATE

Vol. 4, No. 1 April 1999

Annual Issue on Patents

Visit the Carderock Division Patents and Technology Transfer Website

http://www.dt.navy.mil

- *Active And Completed CRADAs*
- *Carderock Division Facilities*
- *Carderock Division Technical Capabilities*
- *Current Edition Of Tech Transfer Update*
- *Frequently Asked Technology Transfer Questions*
- *How To Work With Carderock*
- *Inventions, Patents and Licensing*
- *Links To Forms*
- *Links To Other Technology Transfer Sites*
- *Previous Issues Of Tech Transfer Update*
- *What Is Technology Transfer?*

Future Additions:

- *Abstracts Of Published Papers*

This publication presents opportunities for doing business with the Carderock Division. It highlights our patents available for licensing, and the Division's dual-use facilities and capabilities. We hope this information will help introduce you to our leading edge maritime technologies and personnel.

The opportunities for doing business with Carderock may take shape as CRADAs or work for private party agreements. Information on how to do business with Carderock is on the internet at:

www.dt.navy.mil/techpat/cd_veh.htm

Our unique capabilities are available to support your requirements when they do not compete with private organizations or priority defense work. I invite you to come aboard, meet our personnel and engage in a win-win relationship.

CAPT John Preisel, USN
Commander

Richard E. Metrey
Director

INSIDE

Patent Licensing and Technology Transfer at Carderock

Patents are a cornerstone of the Division's tech transfer program and we are aggressively selecting and showcasing patents that appear to have commercial value. This is a part of the patent licensing efforts and the patent maintenance review process. We do this selection and showcasing through several different mechanisms because of the wide variety of potential commercial applications and licensees. When a technology has a patent application and is selected for its license potential, we market it using several approaches.

On the following pages you will find a list of selected technologies that we have selected as having commercial value. We also use the internet (www.dt.navy.mil), MBA students, professional conferences, contractors, etc. We would like to work with you as a potential licensee and/or a CRADA partner, or as a inventor. The Tech Transfer Office relies very much on the technical staff and our inventors. We recognize each inventor as a benchmark in the licensing and technology transfer process. Please contact us for detailed information on our patents or technologies.

We can work for you!!

Tech transfer includes more than patent licensing and CRADAs. Our laboratories and personnel are national assets for maritime R&D. Often this fact is not understood. The specialized knowledge and facilities of the Carderock labs is available to support industry, academia, and state and federal government activities. Public law 568 (1937) noted that "experiments may be made at this establishment for private parties." Our current mission states we are to support the Maritime Administration and the Nation's maritime industry. The extent of these lab capabilities is reported in the recently published book, "Where the Fleet Begins." This book details the work of these laboratories to transform vision into reality, and keep innovation flowing form cutting edge science and technology into the Navy's ships and submarines. This capability is also available to support you and the Nation's maritime industry.

Evaluating and Marketing Our Patents

During the last four years many new methods have been used to maximize the return from our patent portfolio. Every patent is subject to a five-step formal review process within our organization. The Tech Transfer Office is working with outside experts to identify potential new applications for Navy inventions. The Carderock Division is continually improving its ability to market our patent portfolio and develop stronger partnerships with American industry.

The first indication of an invention's commercial potential begins when an inventor decides that an idea is patentable. In recent years, many of our prolific inventors and their supervisors have attended a one day class that discussed patents, invention evaluation, and technology transfer. This class increased their awareness of industry needs and the potential rewards of licensing and joint research efforts. After an invention disclosure has been submitted, it is reviewed by the Invention Evaluation Board (IEB), a group of senior scientists and managers. There are eight evaluation factors in the IEB's decision to file a patent application. One factor examines the invention's potential to increase the industrial base through tech transfer and dual use. Once the IEB authorizes filing, the inventor completes a Commercialization Potential Baseline Assessment Form. The Tech Transfer Office then seeks the opinion of the inventors concerning the state-of-the-art, important companies active in their field, current industrial practice, and any applicable environmental regulations. Consultation with the inventor is also sought regarding payment of patent maintenance fees.

The Carderock Division is actively involved with academic institutions to find potential licensees. Professors and graduate students at the University of Baltimore's Merrick School of Business and the University of Maryland's Dingman Center for Entrepreneurship have conducted a review of our patents. Their contributions to our commercialization efforts are valued and strengthens the relationships between our inventors and these future business leaders in order to benefit our country's economy.

Carderock Division is also involved in several initiatives designed to promote our technologies and clearly identify the process of doing business with our laboratory. This past summer, the Navy's first patent licensing workshop was held at Carderock. Employees of Geo-Centers Inc. and Carderock introduced a number of corporations interested in specific Navy technologies to the inventors and discussed the patent licensing process. Carderock was one of the first government laboratories to work with the Unisphere Institute and Unifinancial International, members of the Transaction Technology Group. This group is working to commercialize government technologies under the direction of the National Defense Center for Environmental Excellence. Unisphere is currently seeking new markets for three technologies developed by the Carderock Division. In collaboration with Carderock inventors, Foresight Science and Technology is producing two detailed assessments of selected Division patents. As a part of this process, a number of corporations have been contacted and introduced to new high performance materials and devices.

Finally, as a member of the Federal Laboratory Consortium, Carderock uses the services of the National Technology Transfer Center (NTTC) and the Mid-Atlantic Technology Application Center (MTAC). NTTC has provided various courses for Carderock including a course developed specifically for Carderock entitled, "Technology Outreach and Entrepreneurship." Currently, NTTC is reviewing a group of recent Carderock patents in order to match our technologies with some of their corporate clients. Recently, the Carderock Survivability, Structures and Materials Directorate and Tech Transfer Office hosted a meeting with an MTAC client looking for new technologies to apply in the automotive industry.

Carderock will continue to find new applications and methods of leveraging our technologies for commercial industry. The Division has been chartered by the United States Congress to support the nation's maritime industry. Recent tech transfer legislation has increased the opportunity to partner with American industry. The Carderock Division is answering this challenge. We are open for business.

Point of Contact for Patent Licensing is Henry Strunk

Address:
Carderock Division NSWC
Code 0117 attn: Henry Strunk
9500 MacArthur Boulevard
West Bethesda, MD 20817-5700

Phone: (301) 227-1529 –
E-mail:Strunkhg@nswccd.navy.mil

Combined Bulbous Bow and Sonar Dome for a Vessel

Gabor Karafiath and Dominic S. Cusanelli

A new type of bow bulb has been developed and patented for use with U.S. Navy surface ships. This near surface, small-volume, hydrodynamic bow bulb, provides for a powering reduction on Naval ships and is integrated into an existing bow which houses a sonar dome. The bow bulb's nabla shape (an inverted tear drop), location nearer to the free surface, and the reduced size, volume and beam-to-height ratio, are in direct contrast to the geometry of traditional sonar domes.

During the design process, many alternative bow design concepts were evaluated, and preliminary model tests were conducted to assist with the sizing and placement of the selected bulb concept. The design emphasized a bulb that would minimize total ship resistance in the speed range most used by a particular ship, which would increase the potential for significant fuel savings.

The initial design bulb was developed for the DDG 51 Arleigh Burke Guided Missile Destroyer. Model tests showed that this bulb reduced ship resistance by 7% at the cruise speed and by 3% at the maximum speed. Additional advantages of this new bulb, which can be retrofitted to existing ships, include:

- *A 6.2% powering reduction due to the decrease in the total ship resistance*
- *A 4% reduction in fuel consumption due to the decrease in delivered power*
- *An increase in range due to reduced fuel consumption*
- *A 0.2 knot increase in maximum speed due to the decrease in delivered power*
- *Reduced propeller cavitation tendencies due to lower propeller thrust loading*
- *An opportunity to house additional sensors for small object avoidance and for grounding avoidance due to the forebody shape.*

The cost benefits will be realized through a reduction in direct operating and support costs. Total R&D and retrofit/forward fit costs of the bow bulbs are estimated to be roughly $20 million. Net life cycle cost savings for the DDG 51 Class is estimated to be approximately $160 million.

Fuel cost savings, due to the bow bulb installation on the DDG 51 have been estimated to be $116,000 per year per ship. Total cumulative cost of fuel saved for the entire DDG 51 Class (50 ships planned), over a 35 year service life, is estimated to be $180 million. These fuel estimates are considered to be conservative. Initial manufacturing and installation cost estimate for the "initial bulb" is approximately $500,000, while subsequent installations are estimated at $350,000. This estimate indicates that the retrofit cost of a bulb would be paid back through fuel savings in a period of about three years. One hundred and thirteen (113) additional Navy ships have been identified which could benefit presently from this bow bulb technology. The total life cycle fuel cost savings for all possible ships could approach $400 million.

This bow bulb technology can be directly applicable to both the 21st Century Surface Combatant (SC 21) and the next generation Aircraft Carrier (CVX), if the selected hullform for either of these ships is to be a monohull with sonar capabilities.

Patent License Application Process

"... the best technology policy unleashes the creative energies of innovators throughout the economy by creating a market that rewards invention and enterprise."

Clinton Gore Technical Policy
February 22, 1993

Patents are among the most important technical resources available. The Technology Transfer Act of 1986 was written to improve the transfer of intellectual property developed by the Federal labs to the private sector. It established a royalty sharing system for the lab and the inventor. This provided the process and the incentive for patent licensing by the labs. The Carderock Division has established a program to identify the patents having commercial potential and to license them. See our web site for more information on Carderock patents and details on doing business with Carderock.
Web address: http :// www.dt.navy.mil

How to License a Carderock Patent:

The completion of an application is the entry point for applying for a Navy patent license. A key part is the applicant's plan for development and/or marketing the invention, section 14. This plan should contain specific information regarding the amount of fiscal resources, facilities and equipment, technical and other personnel resources, marketing mechanism or other resources the applicant will devote to carry out the plan to bring the invention to the commercial marketplace. The plan must identify a target date by which the invention is to be introduced and should include milestones which measure progress toward reaching that target. In addition, the plan should include projected yearly sales figures for several years of the license.

Notes:

- ***Licensees can only be granted to companies in good standing according to the Federal Acquisition Regulations.***

- ***Licenses are to be fair and reasonable for the Navy and the licensee to insure commercial application of the invention. Most licenses will include an up–front fee, a running royalty, and a minimum annual royalty. Appropriate amounts are negotiated with an emphasis on insuring commercial application, and returning a fare share to the taxpayer.***

- ***The licensing of an invention may include a CRADA with the Division for the transfer of the detail technology, know how, and/or further development of the invention. The use of a CRADA is an excellent approach for a licensee. CRADAs are the means to establish a contractual partnership for commercial development, and to benefit the Navy. Also, both parties have specific rights to new inventions made while doing work under a CRADA. Detailed information on CRADAs is available from the Carderock Technology Transfer Office and the Carderock Web Site.***

Recent Patent Applications with High Commercial Potential

NAVY CASE NO.	INVENTION TITLE	INVENTORS
79,245	*Tailorable Elastomeric Composite Pneumatic Fender System Thereof for Absorbing High Energy Impact and Manufacture*	*Kerry Slattery, Kelli Corona-Bittick, James Dorr, Roger M. Crane*
78,003	*Elastomeric Composite System for Absorbing High Energy Impact*	*Roger M. Crane, Kelli Corona-Bittick, James Dorr*
79,074	*Thickness Determination of Carbonaceous Overlayers on Substrates of Differing Material*	*Robert A Brizzolara, Bruce C. Beard*
78,946	*Explosive Containment Device*	*David T. Wilson*
78,916	*Venturi Muffler Having Plural Nozzles*	*Clyde A. Morehead, John W. Henry, IV*
78,502	*Multiassay Method for Determining the Concentration of Antigens and Interferants*	*Robert A. Brizzolara*
78,132	*Oily Waste Water Treatment Systems*	*Kevin Todd Tompkins, Jerome S. Stefanko, Lawrence W. Tomlinson, Joseph A. Gavin*
79,249	*System for Geometric Modeling*	*Robert M. Ames, Richard Van Eseltine*
79,302	*Shape Memory System for Structural Surface Transformation*	*Thang Dinh Nguyen, David Goldstein*
78,850	*Tapered Resilient Sleeve Bearing Assembly*	*Gus F. Plangetis*
79,062	*Method of Manufacturing Resin Infused Core Structure*	*Paul A. Coffin, Vincent Castelli, Deborah Houghton*
79,141	*Method of Suppressing Thermite Reactions in Plasma Arc Waste Destruction System*	*Inna G. Talmy, James A. Zaykoski, Curtis A. Martin, Jon W. Cofield*
79,232	*Contamination Control of Gaseous Emissions by Corona-Discharge Generation of Plasma*	*Han S. Uhm*
79,277	*Ventilated Outboard Motor-Mounted Pumpjet Assembly*	*John G. Purnell, Alan J. Becnel*

Selected Recent Patents with Commercial Potential

PATENT NO.	TITLE	INVENTORS
5,486,811	Fire Detection and Extinguishment System	John Wehrle, Ernest Dahl, James Lugar
5,521,132	Ash-Based Ceramic Materials	Inna Talmy, Deborah Haught, Curtis Martin
5,227,982	Digital Reverberation Time Measurement System	Blair Kipple, Douglas Noll, Andrew Chiang
5,553,871	Fluid Tight Door Gasket	Marlin Rowe, Francis McMullin
5,358,686	Titanium Alloy Containing Al, V, Mo, Fe, and Oxygen for Plate Application	Warren Parris, James Hall, Paul Bania, Ivan Caplan
5,858,801	Patterning Antibodies on a Surface	Robert A. Brizzolara
5,833,782	High-Energy-Absorbing Enclosure for Internal Explosion Containment	Roger M. Crane, Paul A. Coffin
5,437,821	Process for Making Carbon-Carbon Composites by Using Acetylene Terminated Conjugated Schiff's Base Monomers	Thomas Diberardino, Vicent Castelli
5,426,373	Two Electrode Device for Determining Electrical Properties of a Material on a Metal Substratum	Earl Diamond, George Loeb, Angela Ross
5,025,849	Centrifugal Casting of Composites	Amarnath Divecha, Subash Karmarkar
5,481,904	Oil Spillage Detector	Charles Fleck Sr. and Jr, Michael Sweeney
5,473,718	Fiber Optic Loose Tube Buffer to Fan Out Tube Adapter System	Keith Sommer
5,468,570	Lightweight Zinc Electrode	William Ferrando
5,411,697	Method for Processing Contaminated Plastic Waste	Peter McGraw, John Drake, Thomas Hane
5,389,411	Composite Structure Forming a Wear Surface	Edward Cohen
5,624,577	Disposal of Oil Spill Cleanup Collections	John Wehrle, Eugene Fischer, John Ness, Barbara Howell
5,379,711	Retrofittable Monolithic Box Beam Composite Hull System	Eugene Fischer, Roger Crane
5,800,720	Spinning Filter Separation System for Oil Spill Clean-Up Operation	John Wehrle, Eugene Fischer, William Kenney, Joseph Korczynski, Thomas Gracik, Barbara Howell, William Klemens
5,370,087	Low Vibration Polymeric Composite Engine	David Guimond, Rolf Muench
5,362,580	Lightweight Battery Electrode and Method of Making It	William Ferrando, Amarnath Divecha
5,356,936	Process for Producing Hydrophilic Polymer Membranes	Barbara Howell, Ravanasamudram Venkatachalam, John Wehrle
5,337,288	Acoustic and Vibration Attenuation Composite Material	Usman Sorathia, Joseph Killian, Andrew Jarrett
5,047,990	Underwater Acoustic Data Acquisition System	Adamandios Gafos, Donald Maxwell, Frank Halliwell, Dana Lynn, Christopher Sears
5,266,099	Method for Producing Closed Cell Spherical Porosity In Spray Formed Metals	Paul Kelly
5,408,874	Location of Fluid Boundary Interfaces for Fluid Level Measurement	Charles Fleck, Sr., Charles Fleck, Jr.
5,800,536	Passive Piezoelectric Prosthesis for the Inner Ear	Stanley Fisher, Aime DeReggi
5,797,965	Suppression of Epileptiform Activity	Mark Spano, Steven Schiff, Bruce Gluckman, William Ditto
5,601,867	Method and Apparatus for Generating Fingerprints and Other Skin Prints	Harold Riedl, Robert Jehle
5,760,388	Biomedical Imaging by Optical Phase Conjugation	James Swandic
5,727,381	Duct Flow Control System	Ernest Rogers
5,779,440	Flow Energizing System for Turbomachinery	John Stricker, John Purnell
5,365,457	Dynamic In-Situ Materials Tester & Curemeter	Walter Madigosky

CARDEROCK DIVISION
NAVAL SURFACE WARFARE CENTER
NSWC

http://www.dt.navy.mil

Technology Partnerships
Is the Carderock Division a Part of Your Business Plan?

The Carderock Division has in place several processes or mechanisms to help businessmen develop a technology or product, and bring it to market. These processes are available at all levels ranging from research to test and evaluation and manufacturing technology. They directly support our congressionally mandated mission to support the Nation's maritime industry as well as the technology transfer statutes. This work is generally complimentary to our Navy and DoD work and is intended to provide unique benefits to the private businesses, consortia and universities. Why not make Carderock a part of your business plan?

For further information, please use our internet address: www.dt.navy.mil, or contact the Technology Transfer Office. The phone numbers and e-mail addresses are shown on this page.

The Technology Transfer processes include:

- ✔ ***Work for Private Party Agreements***
- ✔ ***Cooperative R&D Agreements***
- ✔ ***Patent License Agreements***
- ✔ ***SBIR Contracts***
- ✔ ***Potential Navy Contractor Program***

TECH *transfer* UPDATE
DEPARTMENT OF THE NAVY
NAVAL SURFACE WARFARE CENTER, CARDEROCK DIVISION
9500 MACARTHUR BLVD.,
OFFICE OF RESEARCH AND TECHNOLOGY APPLICATIONS, CODE 0117
WEST BETHESDA, MARYLAND 20817-5700

April 1999, Volume 4, Number 1
Tech Transfer Update, (ISSN 1084-6557) is the publication of the Office of Research and Technology Applications, Code 0117.

Tech Transfer Update is published in accordance with NAVSO-P35. Articles appearing in the ***Tech Transfer Update*** may be summaries and news briefs from CDNSWC's publications. Manuscripts submitted for publication, correspondence concerning prospective articles, and changes of address should be directed to Carderock Division, Naval Surface Warfare Center, Office of Research & Technology Applications, Code 0117, 9500 MacArthur Blvd., West Bethesda, Maryland 20817-5700.

CAPT John H. Preisel, USN, **Commander**

Richard E. Metrey, **Director**

Dick L. Bloomquist,
Director, Technology Transfer
(301)227-4299
bloomquistdl@nswccd.navy.mil
Fax (301)227-2138

Henry Strunk
Technology Transfer Manager
(301)227-1529
strunkh@nswccd.navy.mil

Geraldine Yarnall, **Outreach Manager, and Editor**
(301)227-1439
yarnallgr@nswccd.navy.mil

James E. Wood, **CRADA and SBIR Manager**
(301)227-2690
woodje@nswccd.navy.mil

John Forrest
Intellectual Property Counsel
forrestjl@nswccd.navy.mil
(301)227-1834

Yvonne Byrd Watson
Production Editor
(301)227-1146

Approved for Public Release;
distribution is unlimited.